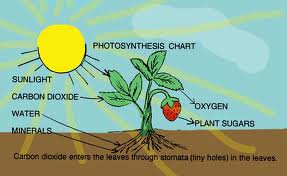
**Photosynthesis & Cellular Respiration**

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| The sun is vital to creation. Almost all life on Earth can trace the energy it needs to survive back to the sun.. |

**Photosynthesis**

Observe the picture above. It represents the flow of energy within an ecosystem. Plants are classified as **producers.** But what do they produce and how do they do it? Using a process called **photosynthesis**, plants convert energy from the sun into a useable form of energy called **glucose**(sugar -- C6H12O6).

To perform photosynthesis, plants require:

* Sunlight
* Chlorophyll, a green pigment found in plants
* Water (H2O)
* Carbon dioxide (CO2)

Just like any power plant that produces energy, plants also emit a by-product. Fortunately for us as humans, that by-product is **oxygen** (O2).

Photosynthesis is a series of chemical reactions that can be represented using the following word equation:

**Photosynthesis  Water + Carbon Dioxide 🡪Glucose + Oxygen**

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| **Did you know?** An average hectare of corn produces enough oxygen per hectare per day in midsummer to meet the respiratory needs of about 325 people. This means that the one million or so hectares of corn grown in Ontario produce enough oxygen for the annual respiratory needs of Ontario's 10 million residents in about 11 summer days! |

Animals, including humans, are classified as **consumers.** But what do we consume?

Animals consume the energy from plants and other animals in a process called **cellular respiration**. In cellular respiration, the energy that the plant created and stored, as glucose, is released so that the animal can move and live. This takes place in each and every cell that an animal has.

The by-products of cellular respiration are water and carbon dioxide.

Cellular respiration is a series of chemical reactions that can be represented using the following word equation:

**Cellular Respiration: Glucose + Oxygen 🡪** **Water + Carbon Dioxide**

Look at the equations for cellular respiration and photosynthesis. What do you notice about them? What does this mean?

Do plants also undergo respiration? Why don’t they just use up all of the oxygen produced then and complete the cycle?

Together, photosynthesis and cellular respiration create a cycle that allows matter and energy to flow through an ecosystem. Producers, such as plants, “take in” carbon dioxide and “give off” oxygen, and consumers, such as humans, breathe in oxygen and exhale carbon dioxide.

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| **Decomposers** are also a part of this cycle. When decomposers break down dead organic matter, they release carbon dioxide into the air. Without this step, carbon would get locked into soil and rock, forming coal and oil deposits, and the cycle would stop. | . |

Left on their own, photosynthesis and cellular respiration achieve a beautiful balance of matter and energy flowing through the global ecosystem. Increased human activity such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_pose a threat to this balance.